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School teachers take on mission to educate

by John Brownlee, Space Vehicles Directorate

KIRTLAND AIR FORCE BASE, N.M. – If current employment trends continue, the Air Force can expect to attract fewer scientists and engineers in the coming years. Retirement from federal service, competitive hiring in the better-paid private sector, and the disconcerting reality of insufficient numbers of math and science majors enrolling in college today explain the anticipated shortfall. And, it is this likely deficit that has federal number crunchers worried.

For a nation whose relatively stable economy and unmatched defense posture for the last half-century is owed directly to honing the sharpest possible technological edge, a red warning flag has been raised. Consequently, government, academic, and private industry planners are now in a huddle to decide how best to avert a pending disaster that threatens the basis of much of America's success: technological superiority.

The Air Force Research Laboratory at its Phillips Research Site in Albuquerque, N.M., is meeting that challenge. Hand-picked top-notch high school teachers from the local community are working with the laboratory to get K-12 students interested not only in math and science, but in possible future careers with the Air Force and other federal research institutions. Rio Rancho Public Schools math teachers, Ronda Cole and Marla Griego, are two such educators now working on-site with AFRL having nearly five decades of classroom experience between them.

"Our outreach programs here, touching the lives of more than 60,000 students since 1992, are geared to inspire young and eager kids, especially the ones we consider to be 'at risk'. And by 'at risk,' I mean those kids who typically believe math and science are not for them, that those subjects are much too hard," said Cole. "By bringing science experts as role models here at AFRL and from private industry such as Boeing and Sandia National Laboratories together with experts in the classroom, teachers, ideally a practical learning environment emerges that will heighten student interest in what are traditionally considered difficult subjects," said Cole. "This is especially important as a student transitions from elementary school, where learning is still fun, through middle school and into high school, where learning and social challenges become increasingly greater. But once a student gets hooked on the possibilities for their own future, they realize that, 'Hey, I'm going to have to take math and science to fulfill my dream.' Here at AFRL, we make that possible by showing our students what is possible, what their potential or talents might be once they get an education, and then give them hands-on experience working with real researchers solving actual problems related to national defense."

PREPARING FOR THE FUTURE — Rio Rancho Public School teacher Ronda Cole is pictured at a 2002 AFRL Mars Missions event.

"Also, the American educational system frequently prides itself on equal access. As a result, if we, as teachers, do not help hold the door open, particularly for students at risk, the entire country may be otherwise deprived of creative minds. These are the same minds that one day could contribute significantly to the nation's technological base—provided they have access and the encouragement we offer," added Griego.

To reach these important goals, Cole and Griego currently oversee four outreach student programs that started ten years ago at AFRL. One is AFRL Students Planning And Conducting Engineering, or AFRL SPACE, and puts high school students to work designing and performing year-long, real-world research and development projects with AFRL-provided mentors.

"Several years ago, our AFRL SPACE students designed an electro-magnetic satellite door that could be closed during a meteor shower, a celestial event potentially harmful to sensitive satellite equipment," said Griego. "Not only did CNN (Cable News Network) come here to do a story on our students, but the work was so well received that the team earned a patent for it!"

Another community-based program with other chapters around the country is the Pinpoint WeatherNet project. With local television station KOB-TV4, the project provides high-quality automated weather stations for 50 New Mexico middle schools and is a non-threatening way to promote the study of science and math.

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"We believe that if middle schoolers are fascinated by weather, they will be better motivated to push themselves harder and take on the complexities of mathematics and other subjects required for a career as, say, a meteorologist," remarked Cole.

Aside from high school and middle school projects, Cole and Griego also coordinate two elementary school projects.

"AFRL Providing Engineering and Technology Experiences for Students, or the AFRL PETES project, helps young students soften the transition between elementary and middle school by fostering student mentoring among fifth and sixth graders," said Griego. "It's often tough for kids crossing over into what they perceive as the Big League, and we can lose promising science and math kids if we don't somehow soften their landing."

Lastly, there is the AFRL Mars Missions project, based on the Challenger Center's Marsville®, The Cosmic Village, perhaps the most widely known program with chapters in many other states. "The AFRL Mars Missions project is an exercise expressly for 5th graders, a classroom-based simulation where student teams rely on cooperation and innovation to actually build a habitat prototype of a colony on Mars," explained Cole. "This year, the eighth for the AFRL Mars Missions project, we had so many participants that we had to hold the event in five different cities around the state on separate days. In fact, enrollment is up so high in this program that we now have the largest Marsville® program in the country, right here in New Mexico," said Griego.

AFRL's education outreach program run by Cole and Griego has indeed been successful over the years. Their program received the Air Force's General Ronald Yates Award for Excellence in Technology Transfer in 1997-98, and the national Federal Laboratory Consortium Award, also for technology transfer, in 2001. @